

**CLAIMS**

1. A printhead comprising:  
a substrate including:
  - 5 a plurality of fluid heating elements; and  
at least one fluid channel that delivers fluid to the plurality of  
fluid heating elements, wherein the at least one fluid  
channel is defined by first and second substantially  
parallel side walls and first and second non-parallel end  
10 walls.
2. The printhead of claim 1 wherein each of the first and second end walls  
is non-linear.
- 15 3. The printhead of claim 1 wherein each of the first and second end walls  
is curved.
4. The printhead of claim 3 wherein the first end wall is defined by a first  
arc having a first radius of curvature, and wherein the second end wall is defined  
20 by a second arc having a second radius of curvature.
5. The printhead of claim 4 wherein the first radius of curvature is  
substantially equal to the second radius of curvature.
- 25 6. The printhead of claim 1 wherein the at least one fluid channel has a  
width dimension defined as the distance between the first and second side walls,  
and wherein the width dimension is at least 15 $\mu$ m.
7. The printhead of claim 1 wherein the at least one fluid channel has a  
30 width dimension defined as the distance between the first and second side walls,  
and wherein the width dimension is at least 15 $\mu$ m and less than 300 $\mu$ m.

8. The printhead of claim 7 wherein the width dimension of the at least one fluid channel is 200 $\mu$ m.

5 9. The printhead of claim 1 wherein the at least one fluid channel has a length dimension defined as the distance between the first and second end walls, and wherein the length dimension is at least 5000 $\mu$ m.

10 10. The printhead of claim 9 wherein the length dimension of the at least one fluid channel is at least 8000 $\mu$ m.

11. The printhead of claim 10 wherein the length dimension of the at least one fluid channel is 8750 $\mu$ m.

15 12. The printhead of claim 1 wherein the at least one fluid channel has a width dimension defined as the distance between the first and second side walls and a length dimension defined as the distance between the first and second end walls, and wherein the width dimension is at least 15 $\mu$ m and less than 300 $\mu$ m, and the length dimension is at least 5000 $\mu$ m.

20 13. The printhead of claim 12 wherein the width dimension is 200 $\mu$ m and the length dimension is 8750 $\mu$ m.

25 14. The printhead of claim 1 wherein the at least one fluid channel is a plurality of fluid channels.

15. The printhead of claim 14 wherein the plurality of fluid channels includes:  
a first fluid channel operatively associated with a first multiplicity of  
30 fluid heating elements of the plurality of fluid heating elements,

the first fluid channel defined by a first slot extending through the substrate;

a second fluid channel operatively associated with a second multiplicity of fluid heating elements of the plurality of fluid heating elements, the second fluid channel defined by a second slot extending through the substrate; and

a third fluid channel operatively associated with a third multiplicity of fluid heating elements of the plurality of fluid heating elements, the third fluid channel defined by a third slot extending through the substrate.

16. The printhead of claim 15 wherein the first multiplicity of fluid heating elements are arranged in at least one column immediately adjacent to the first slot extending through the substrate, wherein the second multiplicity of fluid heating elements are arranged in at least one column immediately adjacent to the second slot extending through the substrate, and wherein the third multiplicity of fluid heating elements are arranged in at least one column immediately adjacent to the third slot extending through the substrate.

17. The printhead of claim 16 wherein each of the at least one column is a column on each side of the respective first, second and third slots.

18. The printhead of claim 15 wherein the substrate further includes:  
a plurality of nozzles through which the fluid droplets are ejected, with  
one nozzle associated with one fluid heating element of the  
plurality of fluid heating elements; and  
5 a plurality of firing chambers with one nozzle of the plurality of nozzles  
and one fluid heating element of the plurality of fluid heating  
elements associated with one firing chamber of the plurality of  
firing chambers.
- 10 19. The printhead of claim 18 wherein the substrate further includes:  
a plurality of fluid feed passageways with at least one fluid feed  
passageway of the plurality of fluid feed passageways associated  
with one firing chamber of the plurality of firing chambers,  
wherein the first fluid channel delivers fluid to the fluid feed  
15 passageways associated with the firing chambers of the first  
multiplicity of fluid heating elements, wherein the second fluid  
channel delivers fluid to the fluid feed passageways associated  
with the firing chambers of the second multiplicity of fluid  
heating elements, and wherein the third fluid channel delivers  
20 fluid to the fluid feed passageways associated with the firing  
chambers of the third multiplicity of fluid heating elements.
20. The printhead of claim 19 wherein the substrate includes:  
a base layer having the first multiplicity, second multiplicity and third  
25 multiplicity of fluid heating elements;  
a barrier layer defining the firing chambers and fluid feed passageways of  
the first multiplicity, second multiplicity and third multiplicity of  
fluid heating elements; and  
an orifice plate defining the nozzles for the first multiplicity, second  
30 multiplicity and third multiplicity of fluid heating elements.

21. The printhead of claim 15 wherein the first fluid channel delivers fluid of a first color to the first multiplicity of fluid heating elements, wherein the second fluid channel delivers fluid of a second color to the second multiplicity of fluid heating elements, wherein the third fluid channel delivers fluid of a third color to the third multiplicity of fluid heating elements, and wherein the first, second and third colors are all different from one another.

22. The printhead of claim 15 wherein the first, second and third fluid channels deliver fluid of the same color to the first, second and third multiplicity's of fluid heating elements.

23. A printhead cartridge for a printing system having a fluid supply for supplying fluid to the printhead cartridge, the printhead cartridge comprising:  
a cartridge body; and  
a printhead die mounted to the cartridge body, the printhead die having a first major surface and an opposite second major surface, the printhead die including:  
a plurality of firing resistors; and  
at least one slot feed fluid channel for delivering fluid to the plurality of firing resistors, wherein the at least one slot feed fluid channel is defined by first and second side walls that are substantially perpendicular to the first major surface, and first and second end walls that are not perpendicular to the first major surface.

24. The printhead cartridge of claim 23 wherein each of the first and second end walls is curved.

25. The printhead cartridge of claim 24 wherein the first end wall is defined by a first arc having a first radius of curvature, wherein the second end wall is

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defined by a second arc having a second radius of curvature, and wherein the first radius of curvature is substantially equal to the second radius of curvature.

26. The printhead cartridge of claim 23 wherein the at least one slot feed  
5 fluid channel has a width dimension defined as the distance between the first and second side walls and a length dimension defined as the distance between the first and second end walls, and wherein the width dimension is at least 15 $\mu$ m and less than 300 $\mu$ m, and the length dimension is at least 5000 $\mu$ m.

10 27. The printhead cartridge of claim 26 wherein the width dimension is 200 $\mu$ m and the length dimension is 8750 $\mu$ m.

28. The printhead cartridge of claim 23 wherein the at least one slot feed  
15 fluid channel is a plurality of parallel slot feed fluid channels.

29. The printhead cartridge of claim 28 wherein each slot feed fluid channel  
of the plurality of slot feed fluid channels delivers a fluid of a different color to corresponding fluid heating elements of the plurality of fluid heating elements.

20 30. The printhead cartridge of claim 28 wherein each slot feed fluid channel of the plurality of slot feed fluid channels delivers a fluid of a single color to the plurality of fluid heating elements.

25 31. A semiconductor substrate having microelectronics integrated thereon comprising:

a plurality of fluid ejecting elements positioned over a substrate;

and,

at least one fluid feed channel formed in the substrate, the at least

one fluid feed channel being configured to deliver fluid to

30 the plurality of fluid ejecting elements, wherein the at

least one fluid feed channel is defined at least in part by

first and second substantially parallel side walls and first  
and second non-parallel end walls.

32. The semiconductor substrate of claim 31, wherein each of the first and  
5 second end walls is generally non-planar.

33. The semiconductor substrate of claim 31, wherein each of the first and  
second end walls is curved.

10 34. The semiconductor substrate of claim 33, wherein the first end wall is  
defined by a first arc having a first radius of curvature, and wherein the second  
end wall is defined by a second arc having a second radius of curvature.

35. The semiconductor substrate of claim 34, wherein the first radius of  
15 curvature is substantially equal to the second radius of curvature.

36. A fluid ejecting device comprised at least in part by the semiconductor  
substrate of claim 31.

20 37. A printing device comprised at least in part by the semiconductor  
substrate of claim 31.

38. The printing device of claim 37, wherein the printing device comprises a  
25 printer.

39. The semiconductor substrate of claim 31, wherein the fluid comprises  
ink.